

Work Order ID 56798

March 10, 2010 12:54:45 PM

Page 1

Item ID: D407-667-205

Accept

Revision ID:

Item Name: Crosstube Aft

Start Date: 10/03/2010 Start Qty: 1.00

Required Date: 25/03/2010 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan: 14

Date: 10-3-10

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D407-667-245

Rev F

100

0.00



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D407-667-205 CHG006

0.00

8-26-13

18 for BG 10/05/13

110

0.00



Packaging

Packaging

Packaging

Memo

0.00

18 MB 10-05-05

120

0.00



CNC Bend 1

CNC Delta 100 Bender

BENDING MACHINE - CROSSTUBES

Memo

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio FT

0.00

10-5-5

56798

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:			WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP		Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

Quality Control

OP 10.05.05

W/O:			WORK ORDER CHANGES					
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140 	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.								
	2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Check dimensions between holes on all four sides.								
	3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.								
	4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.								
	5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245								
	6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.								
	7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.								
	8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.								
	9- Scribe tube to identify on the inner chamfer in the cuff D# and B#								
	10-Deburr & Inspect for surface damage. Repair damage within limits as per								

MB
10-05-06

10-5-06

W/O:			WORK ORDER CHANGES					
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	Dwg D407-667-245								
150	Crosstubes Chemical Conversion	0.00							
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes									
160	QC3- Inspect Part Finish	0.00							
QC	Memo	0.00							
Quality Control									
170	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

AWM

10-5-6

8 10/5/06

8 10/5/06

EO

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	Outsource process - NDT per QSI038 4.1	0.00							
	Outsource2								
	Memo	0.00							
	Liquid Penetrant Inspection as per QSI 0380								
	Issue P/O: 11894 LPI as per ASTM 1417								
	Level 2 Attach copy of NDT results to work order								
190	Packaging	0.00							
	Packaging								
	Memo	0.00							
	Ensure copy of NDT results attached to work order.								
200	QC5- Inspect part completeness to step on W/O	0.00							
	QC								
	Memo	0.00							
	Quality Control								

CZ 10/5/6 ①

P 10/5/6 ①

10 05 07 ①

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	SprayPaint	0.00							
	SprayPaint								
Spray Painting	Memo	0.00							
	1-Prime inside and outside crosstube as per QSI 005 4.2								
	2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME:								
	Start Time: 10.00								
	Finish Time: 11.00								
	PAINT:								
	Start Time: 2.50								
	Finish Time: 3.30								
220	QC14- Inspect Spray Paint	0.00							
	QC								
Quality Control	Memo	0.00							
	Then, Wrap in plastic bag to protect from scratches								

ml 10 05 10 (1)

25 10-05-11

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

230

0.00



Crosstubes

Crosstubes

Memo

0.00

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note: (3) top holes should be facing up.

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps to 80-100 in lb

A/R Magnobond

Batch: 114021

EXP: 01/2011

4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint. → M 10-05-12

ml

10

05

11

①

240



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Solista

Memo

0.00

④

W/O:			WORK ORDER CHANGES					
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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250 	Pick Kit	0.00							
Packaging	Memo	0.00				10	5	12	(12) [Signature]
Packaging									
260 	QC4- 100% Inspect kits for completeness	0.00							
QC	Memo	0.00				10			[Signature]
Quality Control									
270 	Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Identify and in kanban rack Location: 53								

W/O:			WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/05/17

W 10-05-14

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

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Page 1

Work Order ID: 56798

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD516 Purchased No 100 Each 0.0000 18.0000



Washer

D2856-400

Manufactured No

230

f

240.7221

1.3558



Abraison Strip

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST403

240.7220842

50593

138.592084

52563

102.13

D2873-043

Manufactured No

230

Each

49.0000

2.0000



Nut Plate Assembly

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

49

45370

2

45422

1

50871

6

53966

20

56466

20

#56626

M113706 10-5-12

M/ 10.05.11

M/ 10.05.12

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Comments: IPP Rev: C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev: D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

D2873-045

Manufactured No

230

Each

47.0000

2.0000



Nut Plate Assembly

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

47

45210

3

50001

4

53967

20

53968

20

ml 10-05-12

D2894-1

Manufactured No

230

Each

25.0000

1.0000



2.750 Support

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

25

43713

6

43881

18

45483

1

ml 10-05-11

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Shop Packet Print

Page 2

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Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

D3190-1 Manufactured No 230 Each 22.0000 2.0000
Chafing Shield

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST	22	
40109	2	
47456	20	

10.05.11

D407-667-205TRN Manufactured No 230 Each 2.0000 1.0000
Crosstube Turning Detail

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
LG	2	
55833	1	
55834	1	

B-58114 MB 10-05-05

MS20601-AD4W8 Purchased No 230 Each 302.0000 14.0000
RIVET

Warehouse	Loc Qty	Loc Code
Location		
Main Warehouse		
ST322	302	
108521	200	
112203	102	

10.05.12

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IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

MS21920-22

Purchased

No

230

Each

146.0000

4.0000



Clamp(per MIL-DTL-8783C)



Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

146

109495

6

110260

2

111210

38

114077

100

M/ 10.05.11

AN5-10A

Purchased

No

260

Each

80.0000

10.0000



Bolt



1114227 10-5-12

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST337

80

107013

8

110363

2

112314

1

113149

1

113524

18

114056

50

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JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

260

Each

236.0000

4.0000



Bolt

10-5-10 SL

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST340

236

106242

3

106519

4

110363

17

112933

12

113121

100

114056

100

4

AN5-34A

Purchased

No

260

Each

130.0000

4.0000



Bolt

10-5-10 SL

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST340

130

104679

2

107013

2

113149

76

113226

50

4

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Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Comments: IPP Rev: C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev: D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

Start Date: 10/03/2010

Required Date: 25/03/2010

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

260

Each

531.0000 4.0000



Nut



10-5-12 5

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST300

531

110382

10

111636

1

112314

17

113523

107

113537

196

114108

200

MS21920-25

Purchased

No

260

Each

172.0000 2.0000



Clamp(per MIL-DTL-8783C)



42

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

172

108111

3

108975

17

109181

42

109644

10

113281

25

113282

50

113744

25

10-05-11

March 10, 2010 12:54:49 PM

Shop Packet Print

Page 6

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

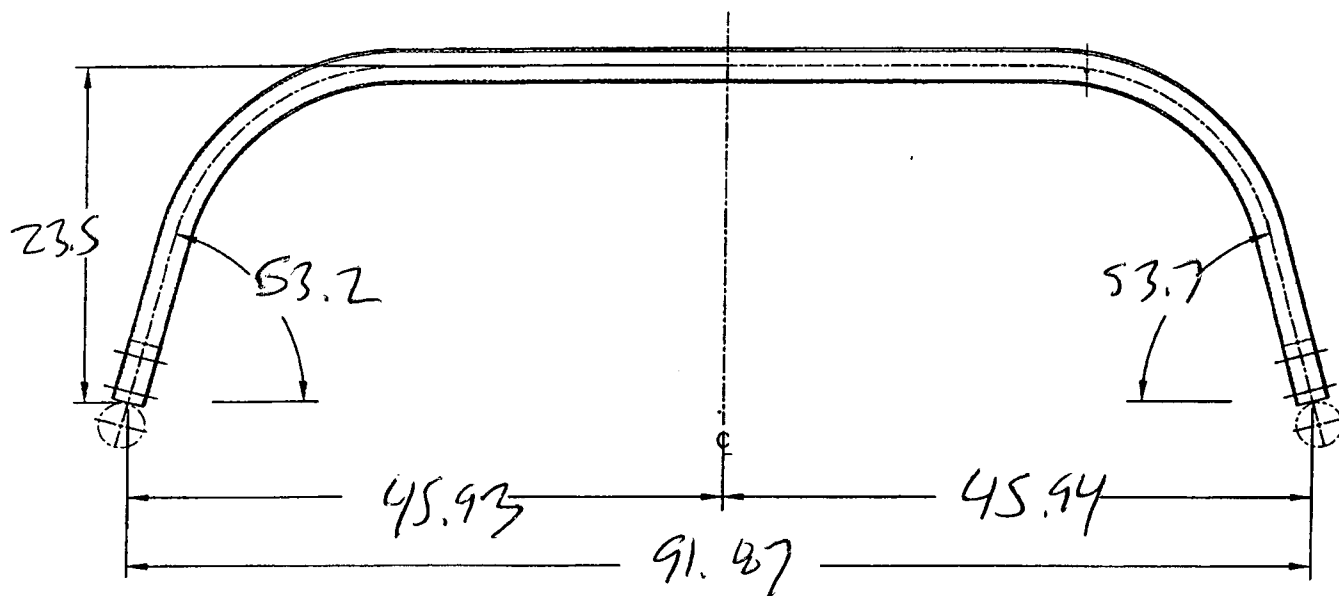
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:			WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP		Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
				Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	56798
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1	

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments
ANGLES UNDER TBL. OK 16.05.05

QC15 Inspection	P
Date	
	16.05.05

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND
6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE
OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *56795*
B-10-3-10

RELEASED
08/11/06

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C8-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>90</i>		
DRAWN	RF		
CHECKED	<i>CP</i>		
MFG. APPR.	<i>90</i>		
APPROVED	<i>90</i>		
DE APPR.	<i>90</i>		
DATE	08.11.06		
DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D407-667-245 TITLE CROSSTUBE ASSY (407 HIGH AFT) REV. F SHEET 1 OF 4 SCALE NTS <small>COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>			

W/O:			WORK ORDER CHANGES					
DATE	STEP		PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

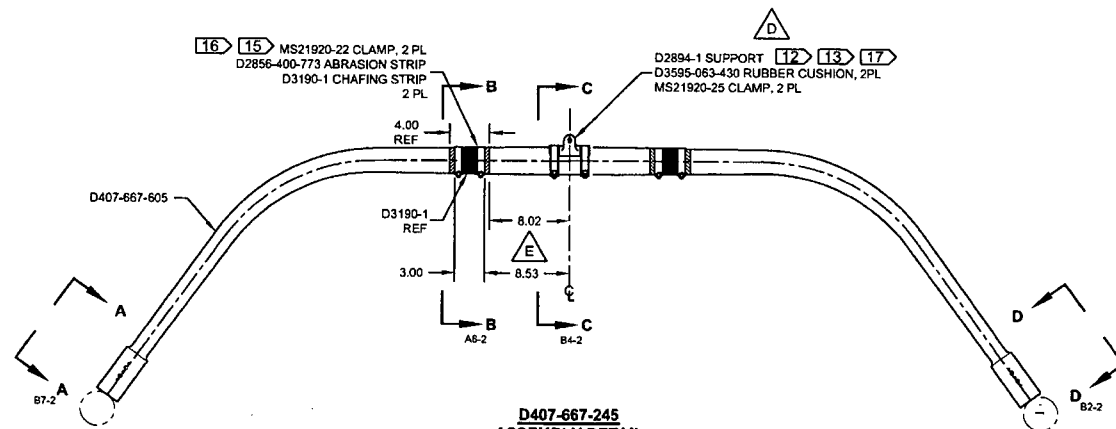
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

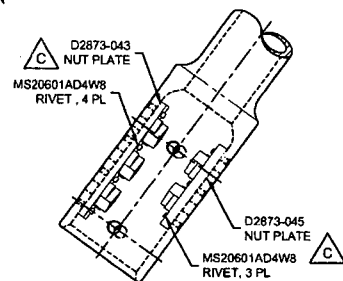
NOTE: Date & initial all entries

16 15 MS21920-22 CLAMP, 2 PL
D2856-400-773 ABRASION STRIP
D3190-1 CHAFING STRIP
2 PL

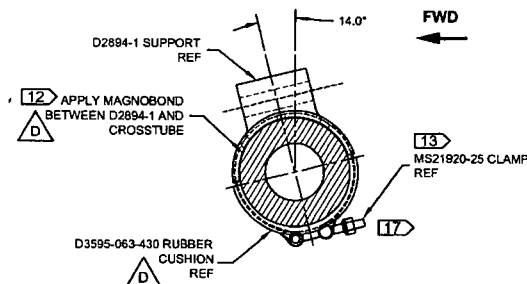
D2894-1 SUPPORT 12 13 17
D3595-063-430 RUBBER CUSHION, 2PL
MS21920-25 CLAMP, 2 PL



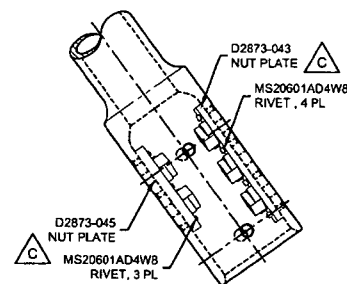
D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



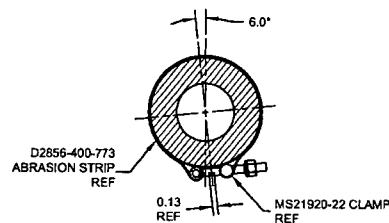
C7-2 **VIEW A-A CUFF DETAIL**
SCALE 4X



C4-2 **SECTION C-C**
SCALE 4X



C2-2 **VIEW D-D CUFF DETAIL**
SCALE 4X



C5-2 **SECTION B-B**
SCALE 4X, 2PL

RELEASED
09/11/2008

DESIGN	90	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	CP	DRAWING NO.	REV. F
MFG. APPR.	EP	D407-667-245	SHEET 2 OF 4
APPROVED	MP	TITLE	SCALE
DE APPR.	MP	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

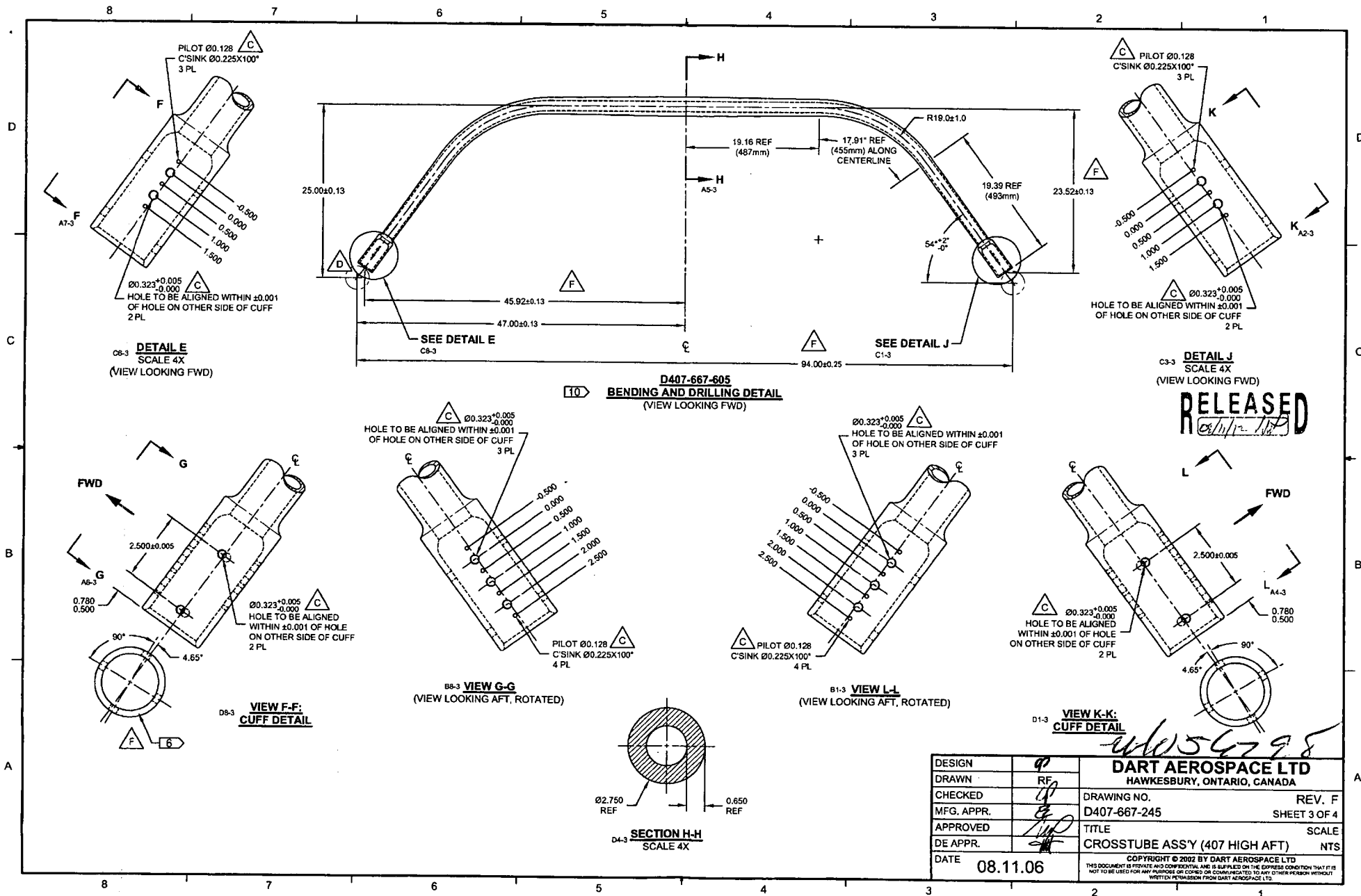
W/O:			WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries



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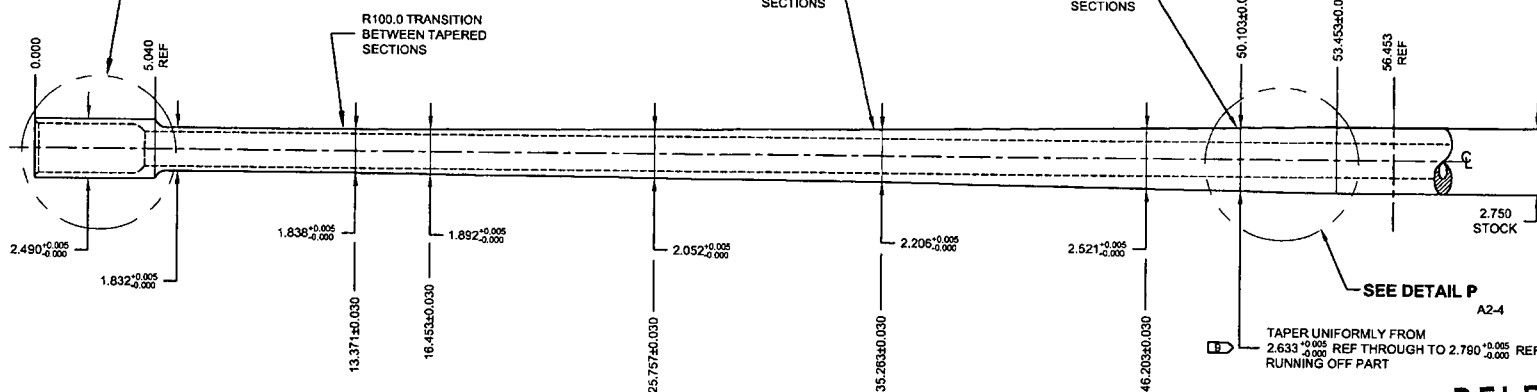
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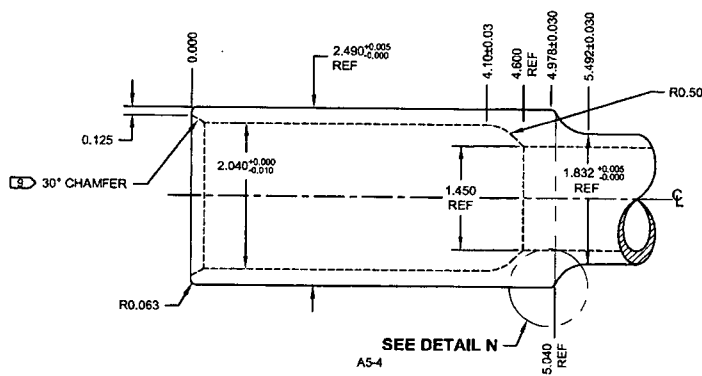
NOTE: Date & initial all entries

SEE DETAIL M
A7-4

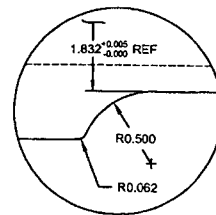


D407-667-245 MACHINING DETAIL

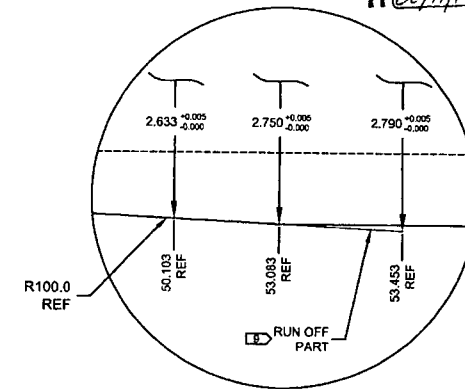
RELEASED
08/11/12



D8-4 **DETAIL M: CROSSTUBE CUFF**
SCALE 3X



B6-4 **DETAIL N: CUFF TRANSITION**
SCALE 2X



C1-4 **DETAIL P: TAPER RUN-OFF**
NOT TO SCALE

DESIGN	407	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	407	DRAWING NO.	REV. F
MFG. APPR.	407	D407-667-245	SHEET 4 OF 4
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DE APPR.	407	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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LIQUID PENETRANT TEST REPORT

P- 05485

CLIENT DART AEROSPACE DATE MAY/06/2010 PAGE 1 OF 1
ATTENTION LINDA KAZLE CHARITAE / PA ACUREN JOB NO. 188-10-0676 TIME AM ☒ PM ☐
ADDRESS 1270, ABERDEEN ST. PO/VO NO. 5000
HAWKESBURY, ON WORK LOCATION AS A ADDRESS
ACCEPTANCE STD. ASTM 1417/05-038 REV./DATE 2005
PROJECT FPI ON 6 X "CROSS TUBES"
ITEM(S) EXAMINED SEE W.O. # BELOW

JOB DESCRIPTION PROCEDURE NO. LT-002 REV./DATE 2008 TECHNIQUE NO. LT-002 REV./DATE 2008
PART NO. MATERIAL ALODINE ALUMINIUM THICKNESS —
SCOPE PERFORMED A WET-FLUORESCENT LIQUID PENETRANT INSPECTION ON 100% OF THE EXTERNAL SURFACE

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☐ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIED
FAMILY BRAND MAGNA FLUX BLACK LIGHT S/N 13798 OUTPUT > 1000 μ W/cm² AMBIENT < 2 fc
PENETRANT ZL-67 MINIMUM DWELL TIME 10 MIN. LIGHTING EQUIP. ☒ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER WATER MINIMUM DRY TIME > 10 MIN. OTHER —
DEVELOPER SKD-S2 MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N — CAL DUE DATE MAY/10/2010
DEVELOPER TYPE ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- ☐ METRIC ☒ IMPERIAL

ITEM	DESCRIPTION	RESULTS
1	WET FLUO L.P.I. ON 100% EX. SURF.	
1	CROSS TUBE - W.O. ID 57235	✓
2	CROSS TUBE - W.O. ID 57236	✓
3	CROSS TUBE - W.O. ID 58187	✓
4	CROSS TUBE - W.O. ID 58188	✓
5	CROSS TUBE - W.O. ID 56797	✓
6	CROSS TUBE - W.O. ID 56798	✓

"CROSS TUBE"
ID: 10-05-07

ITEM ID: - D212-664-201 (ITEM #1-2)
- D212-664-203 (ITEM #3-4)
- D407-667-205 (ITEM #5-6)

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Sam Tillet DTR # E48632
TECHNICIAN (SIGNATURE): [Signature] REPORT REVIEWED BY: —
NAME (PRINT): YES. DESIGNS NAME INITIALS
1ST TECHNICIAN 2ND TECHNICIAN
CGSB LEVEL 2 SNT LEVEL 2 CGSB LEVEL — SNT LEVEL —
CGSB REG. NO. 3049 CGSB REG. NO. —